Compact and Long sensing distance

▣Features

■Long distance sensing type

- ●Long sensing distance with high quality lens
- ●Detects up to 15m(Through-beam type)
- ●Long sensing distance : Diffuse reflective type 1m, Polarized retroreflective type 3m(MS-2A)
- ●M.S.R(Mirror Surface Rejection) function (Polarized retroreflective type)
- ●Compact size: W20×H32×L10.6mm
- ●Protection structure IP65/IP67(IEC standard)
- ●Light ON/Dark ON selectable
- ●Sensitivity adjustment VR incorporated
- ●Reverse polarity, Output short-circuit protection circuit
- ●Auto mutual interference prevention function (Except through-beam type)
- ●Improved noise resistance and minimize effect of inverter disturbance light

⚠ **Please read "Caution for your safety" in operation manual before using.**

Line-up

Connector Type

▣Specifications

※The model name with '-C' is connector type.

Type		Long distance sensing type						
Model	NPN Open collector output	**BJ15M-TDT** **BJ15M-TDT-C**	**BJ10M-TDT** **BJ10M-TDT-C**	**BJ7M-TDT**	**BJ3M-PDT** **BJ3M-PDT-C**	**BJ1M-DDT** **BJ1M-DDT-C**	**BJ300-DDT** **BJ300-DDT-C**	**BJ100-DDT** **BJ100-DDT-C**
	PNP Open collector output	**BJ15M-TDT-P** **BJ15M-TDT-C-P**	**BJ10M-TDT-P** **BJ10M-TDT-C-P**	**BJ7M-TDT-P**	**BJ3M-PDT-P** **BJ3M-PDT-C-P**	**BJ1M-DDT-P** **BJ1M-DDT-C-P**	**BJ300-DDT-P** **BJ300-DDT-C-P**	**BJ100-DDT-P** **BJ100-DDT-C-P**
Sensing type		Through-beam			Polarized retroreflective	Diffuse reflective		
Sensing distance		0 to15m	0 to 10m	0 to 7m	**(*1)** 0.1 to 3m (MS-2A)	1m (Non-glossy white paper 300×300mm)	300mm (Non-glossy white paper 100×100mm)	100mm (Non-glossy white paper 100×100mm)
Sensing target		Opaque material over ϕ12mm		Opaque material over ϕ8mm	Opaque material over ϕ7.5mm	Translucent, Opaque materials		
Hysteresis		————				Max. 20% at sensing distance		
Response time		Max. 1ms						
Power supply		12-24VDC ±10%(Ripple P-P : Max.10%)						
Current consumption		Emitter/Receiver : Max. 20mA			Max. 30mA			
Light source		Infrared LED (850nm)	Red LED (660nm)	Red LED (650nm)	Red LED (660nm)	Infrared LED (850nm)	Red LED (660nm)	Infrared LED (850nm)
Sensitivity adjustment		Built-in VR						
Operation mode		Light ON/Dark ON mode selectable						
Control output		NPN or PNP open collector output • Load voltage : Max. 26.4VDC • Load current : Max. 100mA • Residual voltage☞ NPN : Max. 1V, PNP : Min. (Power voltage -2.5V)						
Protection circuit		Reverse polarity protection, Output short-circuit protection			Reverse polarity protection, Interference prevention function, Output short-circuit protection			
Indicator		Operation : Red, Stable : Green(Emitter's power indicator : Green)						
Connection		**BJ** ☞ Outgoing cable type, **BJ-C** ☞ M8 Connector						
Insulation resistance		Max. 20MΩ(at 500VDC megger)						
Dielectric strength		1000VAC 50/60Hz for 1minute						
Vibration		1.5mm or 300mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours						
Shock		500m/s² X, Y, Z directions for 3 times						
Ambient illumination		Sunlight : Max. 11,000ℓx, Incandescent lamp : Max. 3,000ℓx(Receiver illumination)						
Ambient temperature		Operation : -25 to 55℃, Storage : -40 to 70℃(at non-freezing, at non-dew status)						
Ambient humidity		Operation & Storage : 35 to 85%RH(at non-dew status)						
Protection		**BJ** ☞ IP65(IEC standard), **BJ-C** ☞ IP67(IEC standard)						
Material		Case : PC+ABS, Lens : PMMA, LED Cap : PC						
Cable		**(*2)** **BJ** ☞ ϕ3.5mm, 3P, Length : 2m(Emitter of through-beam type : ϕ3.5mm, 2P, Length : 2m) (24AWG, Core wire diameter: 0.08mm, No. of core wire: 40, Insulator diameter: 1mm)						
Accessory	Common	Mounting bracket, Bolt, Nut, VR adjustment driver						
	Individual	————			Reflector(MS-2A)	————		
Approval		CE						
Unit weight		**BJ** ☞ Approx. 90g, **BJ-C** ☞ Approx. 20g			**BJ** ☞ Approx.60g, **BJ-C** ☞ Approx.30g	**BJ** ☞ Approx. 45g, **BJ-C** ☞ Approx. 10g		

※**(*1)** The sensing distance is extended to 0.1~4m or 0.1~5m when using optional reflector MS-2S or MS-3S.

※**(*2)** M8 connector cable is sold separately.
(Cable ☞ 22AWG, Core wire diameter: 0.08mm, No. of core wire: 60, Insulator diameter: 1.25mm)

Transparent glass sensing/BGS reflective/Micro spot type

▣Features

■BGS reflective type
- ●No effects of background object with Background Suppress(B.G.S) feature
- ●High characteristic then limited distance reflective type's and available for the sensing distance setting with volume
- ●Narrow sensing width and visible spot type
- ●Stable sensing to minimize error range in color or glossy of sensing target

■Transparent glass sensing type / Micro spot type
- ●Stable sensing for transparent object(LCD, PDP, glass etc) by BJG30-DDT
- ●Easy to check sensing location with visible micro spot
- ●Suitable for sensing small objects (Min. sensing object: ϕ0.2mm pure copper wire)

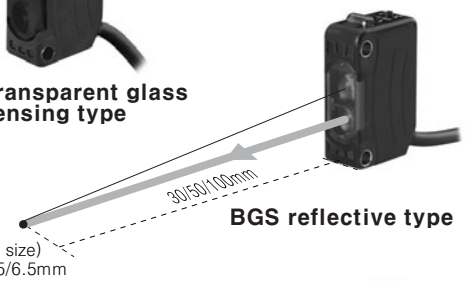
■Commonness
- ●Compact size: W20×H32×L10.6mm
- ●Protection structure IP65(IEC standard)
- ●Light ON/Dark ON selectable(Except BJG30-DDT)
- ●Sensitivity adjustment VR incorporated(Except BJG30-DDT)
- ●Reverse polarity, Output short-circuit protection circuit
- ●Auto mutual interference prevention function
- ●Improved noise resistance and minimize effect of inverter disturbance light

⚠ **Please read "Caution for your safety" in operation manual before using.**

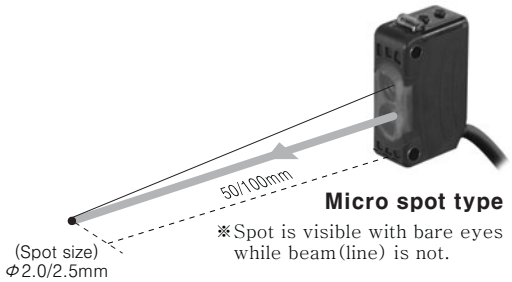
CE

Line-up

Transparent glass sensing type



BGS reflective type



Micro spot type

※Spot is visible with bare eyes while beam(line) is not.

▣Specifications

Type		Transparent glass sensing type		BGS reflective type			Micro spot type	
Model	NPN open collector output	**BJG30-DDT**		**BJ30-BDT**	**BJ50-BDT**	**BJ100-BDT**	**BJN50-NDT**	**BJN100-NDT**
	PNP open collector output	———		**BJ30-BDT-P**	**BJ50-BDT-P**	**BJ100-BDT-P**	**BJN50-NDT-P**	**BJN100-NDT-P**
Sensing type		Diffuse reflective		BGS reflective			Narrow beam reflective	
Sensing distance		0 to 30mm	0 to 15mm	10 to 30mm (Non-glossy white paper 50×50mm)	10 to 50mm (Non-glossy white paper 50×50mm)	10 to 100mm (Non-glossy white paper 100×100mm)	30 to 70mm	70 to 130mm
Sensing target		100×100mm Non-glossy white paper	Transparent glass 50×50mm (t=3.0mm)	Translucent, Opaque materials			Translucent, Opaque materials	
Min.diameter of transmitting SPOT		———		Approx. ϕ5.0mm	Approx. ϕ4.5mm	Approx. ϕ6.5mm	Approx. ϕ2.0mm	Approx. ϕ2.5mm
Min.sensing target		———					Approx. min. ϕ 0.2mm(Copper wire)	
Hysteresis		Max. 20% at sensing distance		Max. 10% at sensing distance			Max. 25% at sensing distance	Max. 20% at sensing distance
Response time		Max. 1ms		Max. 1.5ms			Max. 1ms	
Power supply		12-24VDC ±10%(Ripple P-P : Max.10%)						
Current consumption		Max. 30mA						
Light source/Wavelength		Infrared LED(850nm)		Red LED(660nm)			Red LED(650nm)	
Control output		NPN Open collector output • Load voltage : Max. 26.4VDC • Load current : Max. 100mA • Residual voltage : Max. 1V		NPN or PNP Open collector output • Load voltage : Max. 26.4VDC • Load current : Max. 100mA • Residual voltage ☞ NPN : Max. 1V, PNP : Min. (Power voltage -2.5V)				
Sensitivity adjustment		———		Built-in VR				
Operation mode		Light ON mode fixed		Light ON / Dark ON mode selectable(Short rotator adjuster)				
Protection circuit		Reverse polarity protection, Output short-circuit protection, Interference prevention function						
Indicator		Operation indicator : Red, Stability indicator : Green						
Connection		Outgoing cable type						
Insulation resistance		Min. 20MΩ (at 500VDC megger)						
Dielectric strength		1,000VAC 50/60Hz for 1minute						
Vibration		1.5mm or 300m/s² amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours						
Shock		500m/s² X, Y, Z directions for 3 times						
Ambient illumination		Sunlight : Max. 11,000ℓx, Incandescent lamp : Max. 3,000ℓx(Receiver illumination)						
Ambient temperature		Operation:-25 to 55℃, Storage:-40 to 70℃ (at non-freezing, non-dew status)						
Ambient humidity		Operation & Storage : 35 to 85%RH(at non-dew status)						
Protection		IP65(IEC standard)						
Material		Case : PC+ABS, Lens : PMMA, LED CAP : PC						
Cable		ϕ3.5mm, 3P, Length : 2m						
Accessory		Mounting bracket, Bolt		Mounting bracket, Bolt, Adjustment driver				
Approval		CE						
Unit weight		Approx. 45g		Approx. 50g			Approx. 45g	

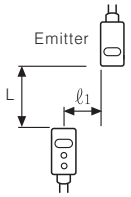
▣Feature data

◎Through-beam

●BJ15M-TDT-(C)-(P) / BJ10M-TDT-(C)-(P) / BJ7M-TDT-(P)

Parallel shifting characterisitic

Measuring method



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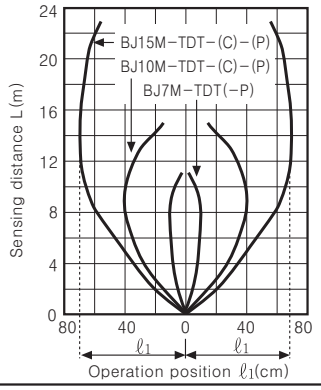
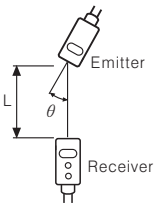


Angle characteristic

Measuring method



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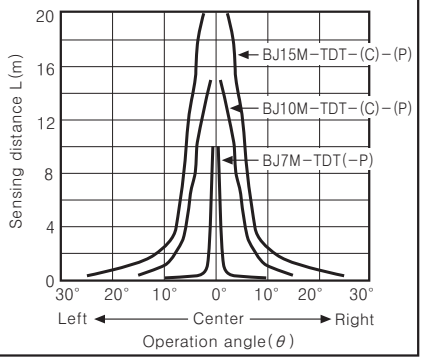
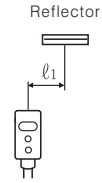


◎Retroreflective type

●BJ3M-PDT-(C)-(P)

Parallel shifting characterisitic

Measuring method



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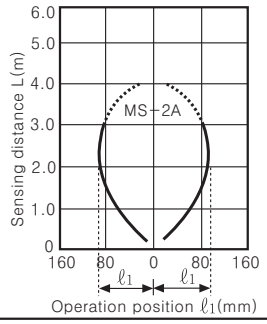
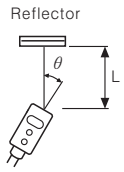


Sensor angle characteristic

Measuring method



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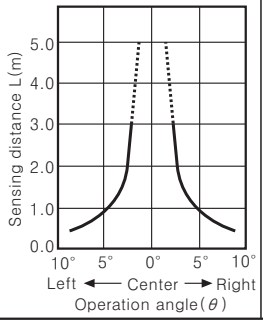
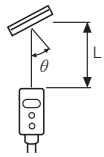


Reflector angle characteristic

Measuring method



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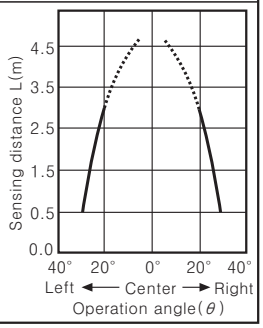
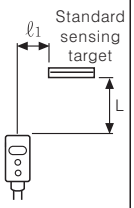


◎Diffuse/Narrow beam reflective

●BJ1M-DDT-(C)-(P)

Sensing area characteristic

Measuring method



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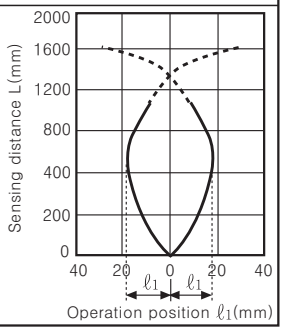
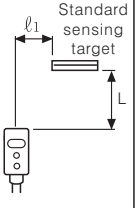


●BJ300-DDT-(C)-(P)

Sensing area characteristic

Measuring method



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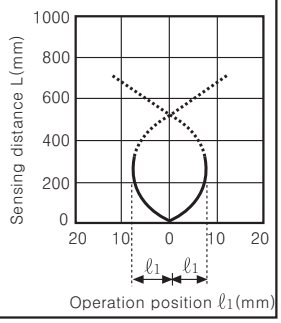
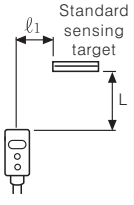


●BJ100-DDT-(C)-(P)

Sensing area characteristic

Measuring method



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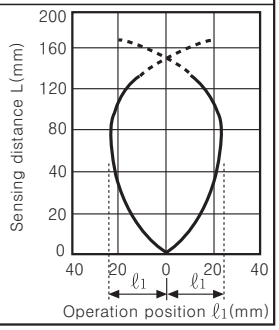
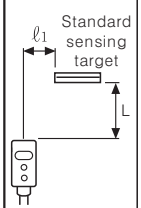


●BJG30-DDT

Sensing area characteristic

Measuring method



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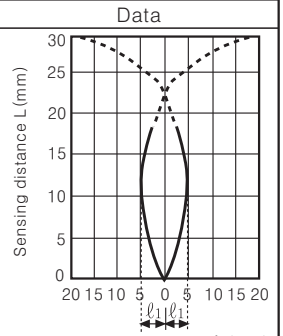
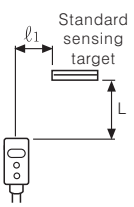


●BJN50-NDT-(P)

Sensing area characteristic

Measuring method



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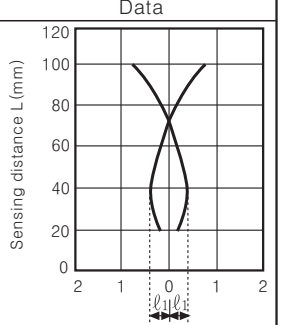
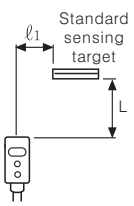


●BJN100-NDT-(P)

Sensing area characteristic

Measuring method



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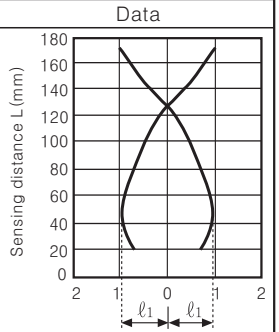
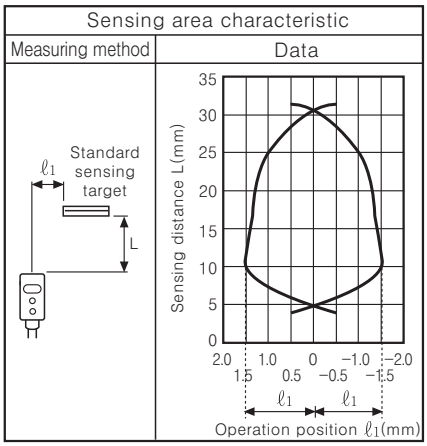
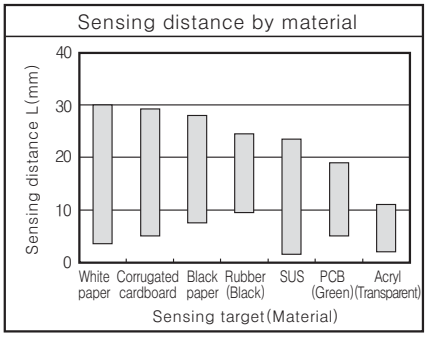


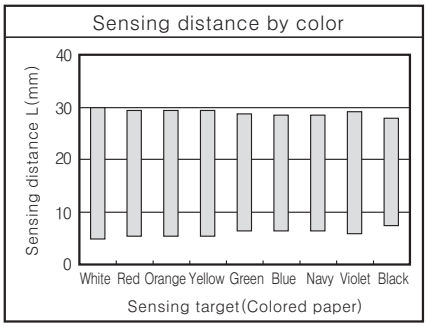
▣Feature data

◎BGS reflective

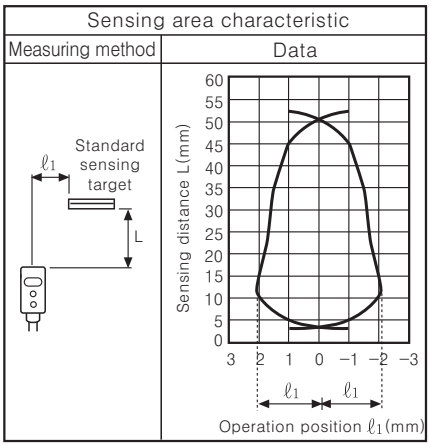
●BJ30-BDT / BJ30-BDT-P

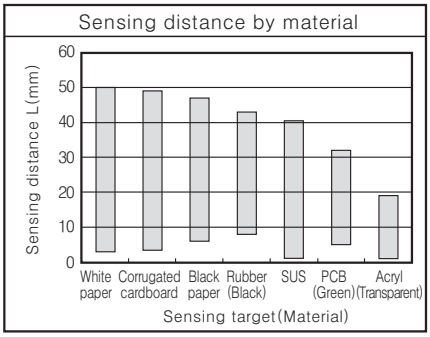


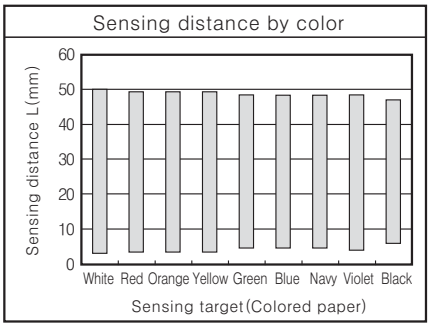




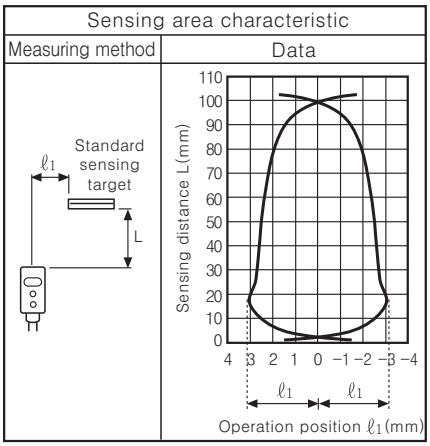
●BJ50-BDT / BJ50-BDT-P

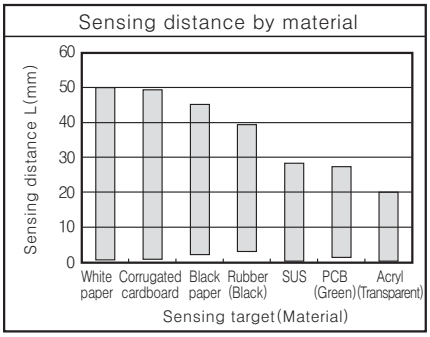


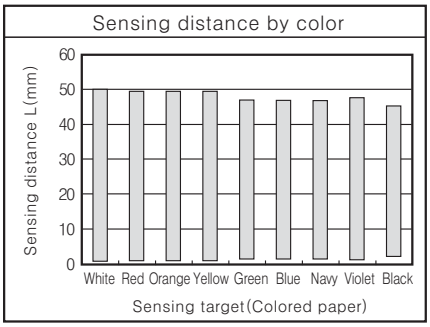




●BJ100-BDT / BJ100-BDT-P

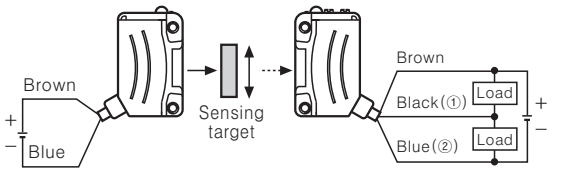




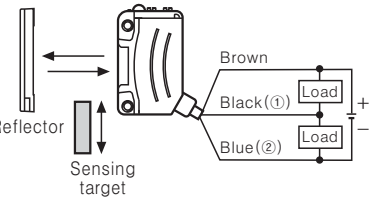


▣Connections

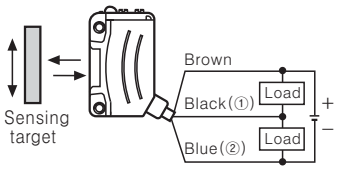
●Through-beam



●Retroreflective

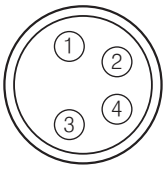


●Diffuse/Narrow beam/ BGS reflective



※① : The load connection of NPN open collector output, ② : The load connection of PNP open collector output

▣Connections



M8 Connector pin

Connector pin No.	Cable colors	Function
①	Brown	Power Source(+V)
②	White	—
③	Blue	Power Source(0V)
④	Black	Output

※Connector pin ② is N.C(Not Connected) terminal.

●Connector cable(Sold separately)

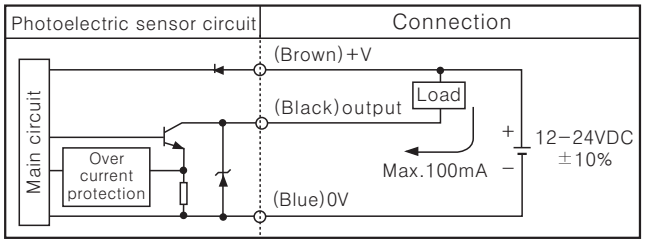
※Connector cable model
: CID408-□, CLD408-□

※Please refer to G-5 for connector cable.

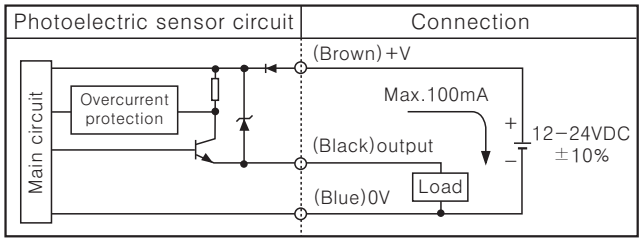
Long sensing distance/BGS reflective/Micro spot type

▣Control output diagram

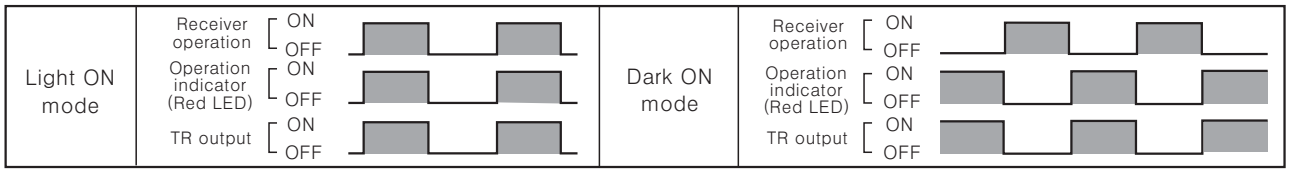
●NPN output



●PNP output



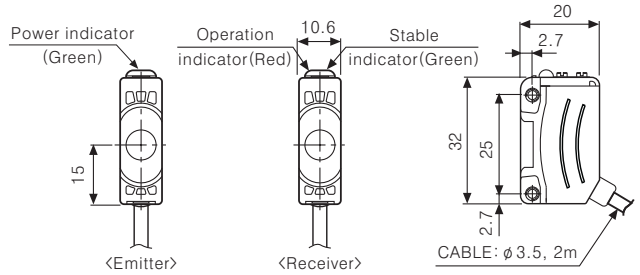
▣Operation mode



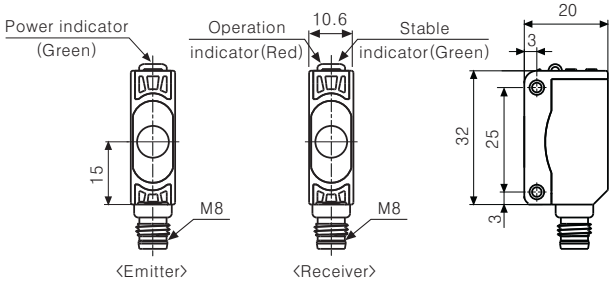
▣Dimensions

(Unit:mm)

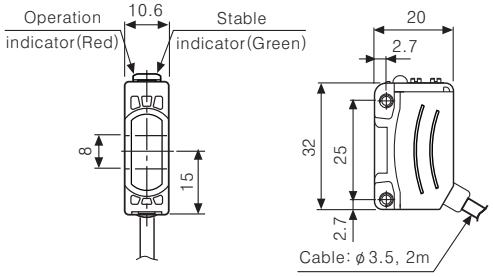
●Through-beam



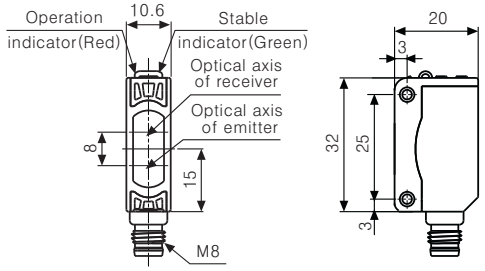
●Through-beam(Connector type)



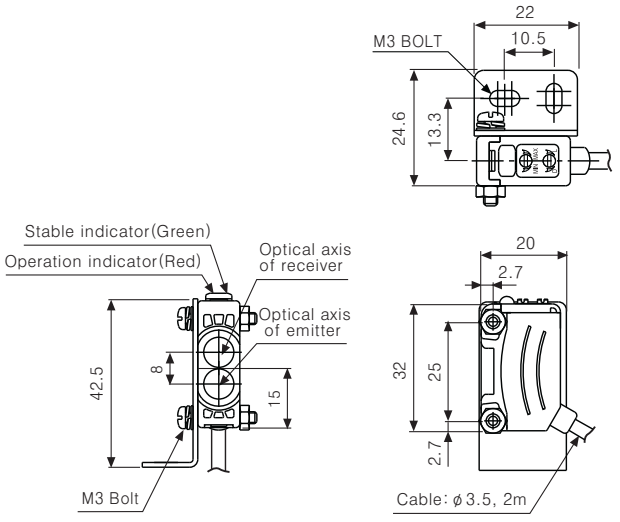
●Retroreflective



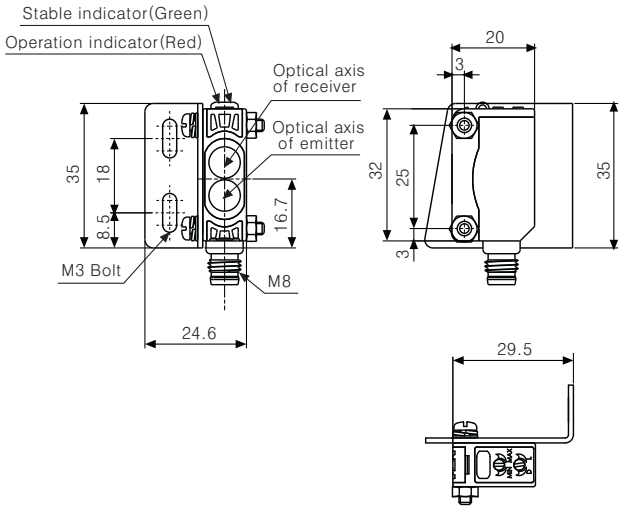
●Retroreflective(Connector type)



●Diffuse/Narrow beam/BGS reflective
(Connect the bracket A)



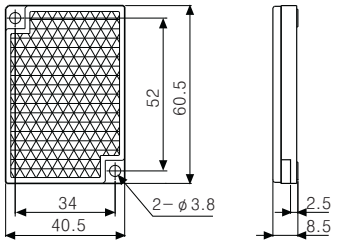
●Diffuse reflective(Connector type)
(Connect the bracket B)



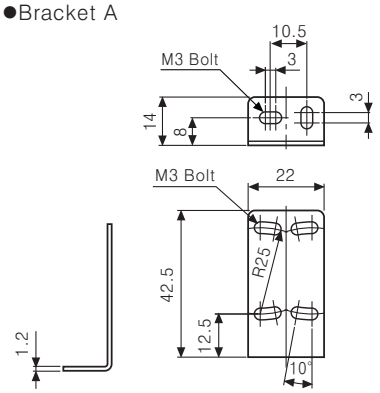
▣Dimensions

(Unit:mm)

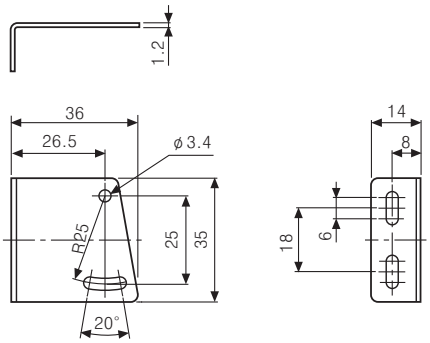
●Reflector
(Include:MS-2A,
Sold separately:MS-2S, MS-3S)



●Bracket A

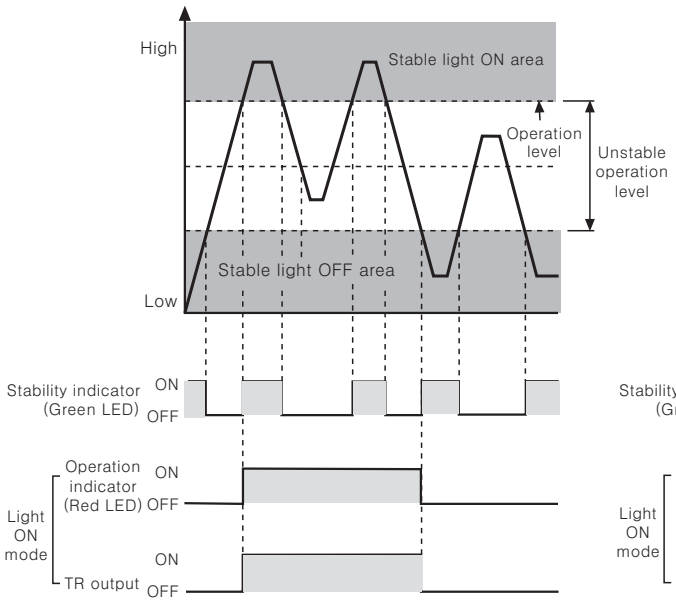


●Bracket B(Sold separately)

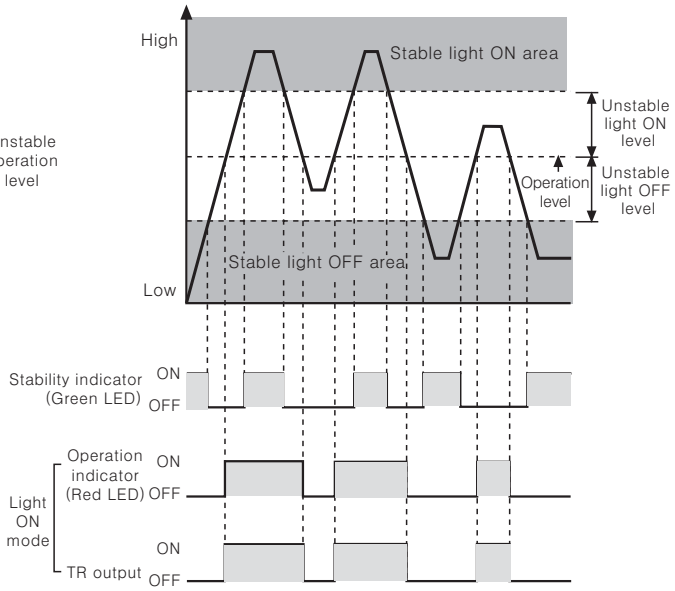


▣Operation timing diagram

◎Through-beam



◎Diffuse/Narrow beam/BGS reflective

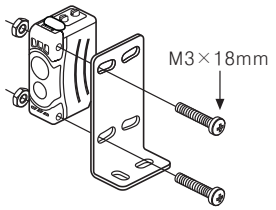


※The waveform of "Operation indicator" and "TR output" is for Light ON mode, it is operated conversely for Dark ON mode.

▣Mounting and sensitivity adjustment

◎For mounting

Please use M3 screw for mounting of sensor, set the tightening torque under 0.5kgf·cm.



◎Switching of operation mode

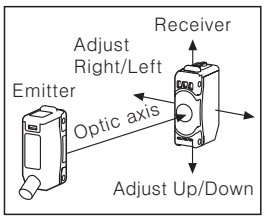
Light ON operation mode (Light ON)		Turn the operation switching adjuster to right(L direction), it is set as Light ON mode.
Dark ON operation mode (Dark ON)		Turn the operation switching adjuster to left(D direction), it is set as Light OFF mode.

※The operation switching adjuster is installed in the receiver for transmitted beam type.

◎Mounting

●Through-beam type

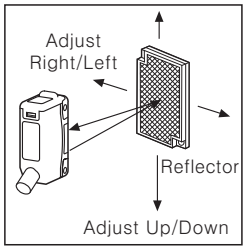
1. Place the emitter and receiver facing each other and apply the power.
2. After adjust the position of the emitter and receiver and check their stable indicating range, mount them in the middle of the range.
3. After mounting, check the operation of sensor and lighting of stable indicator in both status. (None or sensing target status)



※When the sensing target is translucent or small (under sensing target of ▣**Specifications**'), it can be missed by the sensor because the light can penetrate it.

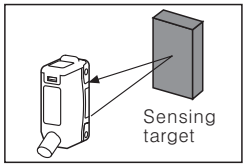
●Retroreflective type

1. Place the sensor and reflector facing each other and apply the power.
2. After adjust the position of the sensor and reflector and check their stable indicating range, mount them in the middle of the range.
3. After mounting, check the operation of sensor and lighting of stable indicating in both status. (None or sensing target status)

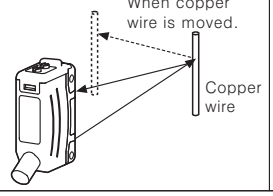
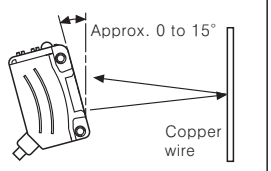


●Diffuse/Narrow beam/BGS reflective type

After place a sensing target, adjust the sensor to up or down, right or left. Then, fix the sensor in center of position where the indicator is operating.



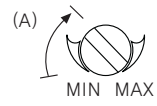
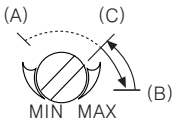
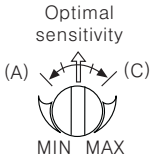
●Object(Copper wire) detection <Micro spot type>

[Figure 1]	[Figure 2]
	

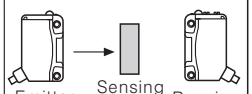
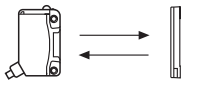
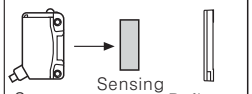
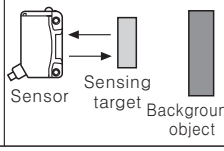
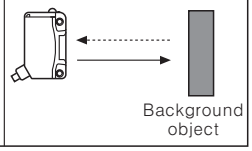
※Mount sensor slanted at an angle ranged 0 to 15 ° shown above as [Figure 2] for stable detection to detect as shown in [Figure 1].

▣Sensitivity adjustment

◎Sensitivity adjustment

Order	Position	Description
1		Turn the sensitivity adjuster to the right of min. and check position(A) where the indicator is turned on in "Light ON status".
2		Turn the sensitivity adjuster more to the right of position(A), check position(B) where the indicator is turned on. And turn the adjuster to the left, check position(C) where the indicator is turned off in "Light OFF status". ※If the indicator is not lighted although the adjuster is turned to the max. position, the max. position is(C).
3		Set the adjuster at the center of (A) and (C). To set the optimum sensitivity, check the operation and lighting of stable indicator with sensing target or without it. If the indicator is not lighted, please check the sensing method again because sensitivity is unstable.

※No sensitivity adjustment function available for BJG30-DDT models

	"Light ON status"	"Light OFF status"
Through-beam type		
Retro-reflective type		
Diffuse/ Narrow beam/ BGS reflective		

※Set the sensitivity to operate in a stable light ON area, the reliability for the environment(Temperature, voltage, dust etc) will be increased.

※Do not apply an excessive force on adjuster, it can be broken.